Amendments to the Claims:

1. (Current Amended) A non-interferometric method for determining the optical temporal response of an optically scattering medium to a short optical pulse excitation, said method comprising the following steps:

(a) sending a modulated beam of light from a light source through said medium, wherein said light is comprised of at least some of the spectral frequencies which make up the Fourier transform of said short optical pulse ~~to be emulated~~;

(c) ~~determining~~measuring, for each of said spectral components, the relative amplitude ~~and phase change of each of said spectral components~~ with respect to that of said light source;

(c1) measuring, for each of said spectral components, the difference between the modulation phase of said light exiting said medium and the modulation phase of said modulated beam of light entering said medium;

(c2) determining, the phase change of the optical field of each of said spectral components with respect to that of said light from said light source entering the medium from the values of the difference between the modulation phase of said light exiting said medium and the modulation phase of said modulated beam of light entering said medium;

(d) obtaining the spectral response of said medium from said relative amplitude changes and optical field phase ~~change~~ changes ~~the spectral response of said medium~~;

(e) computationally performing an inverse Fourier transform on said spectral response; and

(f) obtaining the temporal response of said medium to said emulated short pulse from said inverse Fourier Transform; and

(g) ~~if necessary,~~ repeating step (a) through (f) until said optical temporal response is determined to a pre-determined accuracy, wherein the light sent through said medium in each succeeding cycle is at least partially comprised of different spectral frequencies from those of the preceding cycles;

characterized in that the relative amplitude and phase change of each of said spectral components with respect to that of said light source are determined from a single beam of <u>modulated</u> light.

2. (Original) A method according to claim 1, wherein the light comprises substantially all of the spectral frequencies, which make up the Fourier transform of the short pulse to be emulated.

3. (Original) A method according to claim 1, wherein the light comprises substantially less than all of the spectral frequencies which make up the Fourier transform of the short pulse to be emulated.

4. (Original) A method according to claim 1, wherein the light has a carrier frequency, which is scanned over time; and the relative amplitude and phase change are determined for each carrier frequency.

5. (Original) A method according to claim 1, wherein the light consists of a broad spectral bandwidth and each of the spectral components of the output of said light exiting the medium are detected.

6. (Original) A method according to claim 1, wherein the light is detected either at a point, along a line, or over a two-dimensional area.

7. (Original) A method according to claim 1, wherein the light transmitted through the medium is detected.

8. (Original) A method according to claim 1, wherein the light reflected back from the medium is detected.

9. (Original) A method according to claim 1, wherein the light, which exits the medium at any angle with respect to the illumination path, is detected.

10. (Original) A method according to claims 1, wherein at least one object is embedded within the medium.

11. (Original) A method according to claim 10, wherein the at least one object is detected.

12. (Original) A method according to claim 10, wherein the at least one object is

imaged.

13. (Original) A method according to claim 10 where the at least one object comprises

biological tissue and the medium comprises a segment of the human body.

14. (Original) A method according to claim1, wherein the medium comprises discrete

layers.

15. (Current Amended) A method according to claim 1, wherein the 'first light'

response, which is indicative of the position and shape of ~~said~~ <u>an</u> object or objects embedded in

an optically ~~turbid~~ <u>scattering</u> medium and/or obstructed by other objects, which are at least

partially transparent, is determined from the optical temporal response.

16. (Current Amended) A method according to claim 1, wherein a specific segment of

the temporal response, which is indicative of the position and shape of ~~the~~ <u>an</u> object or objects

embedded in an optically ~~turbid~~ <u>scattering</u> medium and/or obstructed by other objects, which are

at least partially transparent, is determined from said optical temporal response.

17. (Canceled).